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ABSTRACT

This study addressed assessing the efficacy and outcomes of a U.S. Department of Agriculture Nutrition Education Training (NET) project designed to increase awareness of health risk and wellness factors for grade 9 students. Although this paper reprises results from a survey of 125 ninth graders about the NET curriculum, the focus of this part of the study is on school and community NET impact. Community participants were drawn from two school districts, local hospitals and universities, local health agencies, and volunteer organizations, including the 4-H program. In all, there were more than 1,500 ninth grade participants and a number of school and community partners involved in the training and curriculum delivery. A results mapping scheme was developed to measure outcomes on the multiple objectives of the program with mapping sentences for each of the facets of the project. This scheme became quite complex, and an additional results mapping scheme should be developed to address the school district and community participation component of the project. This would allow several ways to assess perceptions of the degree of relative difficulty on attainment of dimensions. Program efficacy should be assessed in terms of benefits to the community based on a number of considerations, including costs, numbers of students served, results, attitude changes, and the effects of school and community interactions. Two appendixes contain questions from the Net assessment and a wellness survey. (Contains 7 tables, 3 figures, and 19 references.) (SLD)

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Part II: School and Community Impact

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TM 033 257

Efficacy, Outcomes, and Empowerment Evaluation of a School District NET Project

Part II: School and Community Impact[1]

If the adages, "it takes a village to raise a child" and "you are what you eat" are true, then the goals and objectives of the USDA supported FIT-KID NET (Nutrition Education Training) program might have been written to address just those ideas. The NET program has been designed to raise community awareness of family health issues and to encourage schools, students, and communities to work together to promote healthy children and healthy families. While the school lunch program forms the centerpiece of Tennessee's School Nutrition Department, Nutrition Education Training is designed to promote interaction between the school, school cafeteria, nutrition experts, healthcare providers, and the community and to encourage children and young adults to develop healthy eating habits. The specific objectives of NET target areas that have been linked through research to such adult health risks as diabetes, high blood pressure, heart attack, arteriosclerosis, alcoholism, stroke, osteoporosis and obesity. Not only do such health risks lead to diminished quality of life for sufferers and their families, they may also lead to the need for costly medical treatment or even death. Therefore, the goal is to provide training that will empower teens to develop wellness habits that will help them to do better in high school, college, and into their adult years. Wellness programs conducted at the school district level can provide educational and emotional support for the needs of adults as well as of the school district's children. Herman & Herman (1991) point out that "Such strategies must be combined with the undertaking of risk reduction and health promotion benefits, both for the direct advantage to the district and for the promotion of employee morale" (p. 12). While this statement refers to the implementation of Employee Assistance Programs, by extension its applicability to students within the school district is apparent. Thus, the implementation of a district wide student -to-school employee nutrition and wellness program might become a vertical dimension of the district's strategic planning process (Kaufman & Herman, 1991). From both a cost effectiveness and cost benefit perspective, a project of this type is very low risk as it requires no change or rewriting of the curriculum, it promotes the use of expertise from human resources available within the school district and community, and it addresses a social problem: i.e., the risk behaviors of students entering high school, one of the more critical transitions that young people make as they enter the adult world (Scriven, 1991).

The NET program provides prospective participants with a variety of needs assessments designed to measure the knowledge, attitudes, or nutrition and health related behaviors of students ranging in age from prekindergarten (a survey administered to parents and caregivers) to high school. The NET teen Health Index scale discussed in this paper was developed by the author based on items from one of the NET assessment instruments and from similar items on the Youth Risk Behavior Survey (Drummond, 2000; Miller-Whitehead, 2001). Even though all the items of the assessment were related to nutrition, self-concept, or health, the scope of items

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[1]Project funded in part by the USDA Tennessee Department of Education Nutrition Education Training grant Z-97-078595-00 in cooperation with community agencies

included within the assessment was very broad (Rudner, 1994). Thus the items were arbitrarily grouped into seven subscales to facilitate interpretation of results and pre- and posttest comparisons by subscale should time or budget constraints not allow for administration and scoring of the entire 41 item assessment. The seven subscales were identified as measures of Nutrition (6 items), Physical Activity (6 items), Family Health History (5 items), Substance Abuse (7 items), Traffic Safety (4 items), Personal Values (5 items), and Self-Care (8 items).

The assessment was administered in a Tennessee public school system of over 16,000 students to a random sample of 125 rising grade 9 students selected from Wellness classes at each of the county high schools, an equal number from each school. These students were a representative sample of ninth grade students (average age = 14.5 years) in a school system where the county population was approximately 15% minority with less than 7% qualified for free and reduced meals. The sample population was drawn from a population of approximately 1,500+ grade 9 students in the school district. To protect confidentiality, student responses for the 41 item assessment were coded only by age, gender, and school. Standardized item alpha for the 41 item assessment based on a sample size of 125 students was .86. Although large sample sizes are desirable for a variety of reasons they are not always economical or cost effective and sampling adequacy was deemed to be appropriate for making group comparisons by gender and by school based on accepted practices in clinical research (Kraemer, 1981).

Nutrition and Health Behavior Outcomes

Although the NET program directorate provided a 41 item survey that could be used as a measurement instrument, Tennessee NET program objectives were limited to the following areas based on Dietary Guidelines for Americans[2]:

Dietary Guidelines:

1. Eat a variety of foods
2. Balance the food you eat with physical activity. Maintain or improve weight
3. Choose a diet with plenty of grain products, vegetables, and fruits
4. Choose a diet low in fat, saturated fat, and cholesterol
5. Choose a diet moderate in sugars
6. Choose a diet moderate in salt and sodium
7. If you drink alcoholic beverages, do so in moderation

Based on results of a preliminary needs assessment, school district FIT-KID NET program participants selected two to three of the above objectives as target areas for their school district projects, with project goals for fiscal year 1996-1997 grade 9 Wellness students as follows:

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[2]Source: TN Nutrition Education & Training Program. (1996). Nashville: Tennessee State Department of Education.

1. Choose a diet with plenty of grain products, vegetables, and fruits.
2. Choose a diet low in fat, saturated fat, and cholesterol.
3. Eat a variety of foods.

Table 1 provides pretest and posttest composite score means by school for the 41 item NET Wellness Assessment. While there were significant differences between schools on the 41 item pretest administered to grade 9 students in September of 1996, there were no significant differences by school on the total score for the 41 item posttest administered to the same cohort of grade 9 students in April of 1997. Table 1 also provides demographic information on the community characteristics for each school, drawn from 1990 U.S. Census data.

Insert Table 1 about here

Table 1 indicates that the high school with the lowest pretest FIT-KID Wellness score (School B) also had the lowest median household income and the highest percentage of African American community residents of any of the 5 high schools. Although several other high schools had higher posttest composite Wellness scores on the NET assessment than School B, on the posttest School B was the only school to show a gain over its composite pretest Wellness score. The activities, materials, and training provided through the NET program had only nutrition and healthy eating habits as specific goals and objectives. For the entire sample population of grade 9 students, the posttest mean ($n = 100$, $\underline{M} = 2.17$, $\underline{SD} = 1.27$, $\underline{SE} = .1272$) for items measuring nutrition and healthy eating habits was higher than the pretest mean ($n = 125$, $\underline{M} = 2.07$, $\underline{SD} = 1.39$, $\underline{SE} = .1245$). The following formula was used to determine the effect size of the difference in the pretest and posttest means for the sample population of grade 9 students for assessment items that measured healthy eating and nutrition.

$$\underline{d} = \mu_1 - \mu_2 / \sigma$$

Where μ_1 and μ_2 are the population means for posttest and pretest, and σ is the pooled standard deviation of the pretest and posttest group. While the pre- post effect for composite mean score on 6 nutrition questions was positive, the effect size of .07 was very small. However, according to best practices of program evaluation, results should also be placed in context of what might have happened had the program not occurred (Fitz-Gibbon & Morris, 1987). Therefore, pre- and posttest means for items that were not specific objectives of the NET Wellness project were compared with pre- and posttest means of items that were specific NET project objectives.

Based on USDA findings, people with higher education levels and higher income in nonrural non-Southern areas had better nutrition habits than people with lower income and lower levels of education living in rural areas, with African Americans generally having less healthy eating habits than other racial groups (Bowman et al., 1998). According to Table 1, the community profile for School D indicates that students attending that school would be likely to have had better nutrition and eating habits than students attending Schools A, B, or C. Table 2

shows that both the pretest mean score and the posttest mean score for Nutrition[3] for School D were higher than for Schools A, B, or C, schools located in communities with lower median household income and lower percentages of residents with higher levels of education.

Insert Table 2 about here

Table 3 provides pre- and posttest means and effect sizes by school for the specific objectives of the FIT-KID NET grade 9 Wellness project. Based on results of a random sample of grade 9 students there were significant gains at each of the 5 high schools in the percent of students who responded that they ate at least five servings of fruits, vegetables, and grain products daily. Pre- and posttest means indicated that 2 of the 5 high schools (A and B) had significant gains in the percent of students who reported that they limited their consumption of high fat foods to 2 -3 serving per week (Table 3). Positive effect sizes for the pre- and posttest differences ranged from between .07 to .57, with effect sizes of .20 generally considered small, .40 medium, and .80 large (Cohen, 1988; Nix & Barnette, 1998; Shadish, Robinson, & Lu, 1999).

Insert Table 3 about here

While there were no significant posttest differences between schools on percent of students who reported that they limited their consumption of foods high in fat or cholesterol, the percent of students at School A who reported limiting fat consumption nearly doubled. There were significant posttest differences between schools in percent of students who reported consumption of at least 5 servings of fruit, vegetables, and grain products each day. The ANOVA summary table is provided in Table 4. School D, in an affluent community, had a significantly higher posttest percent of students who reported eating at least 5 servings of fruits, vegetables, and grains daily than did either School A or School E, located in less affluent communities (Table 1). These results were consistent with those of the USDA Healthy Eating Index report (1998). However, the only two schools that improved on both FIT-KID objectives were School A and School B, both in less affluent parts of the county.

Insert Table 4 about here

For comparison purposes, there was no pre- and posttest difference in the percent of students who reported that they limited consumption of candy, cola, snacks, and sweets to 2 -3 servings per week, not a specific objective of the FIT-KID project although it was a component of the teen HI Nutrition scale (Appendix A). Although at two of the schools there was an increase in percent of students who reported that they limited consumption of candy, cola, and snacks, two

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[3]Based on a composite score for six questions about diet and nutrition, Appendix A.

schools reported a decrease, with the pre- and post district-wide percentage remaining constant at 22%. However, the high schools in the study used vending machine revenues and sale of candy to raise money for school projects and easy access to candy, cola, and sweets may have had an effect on student behavior related to limiting consumption of sweets and snacks.

Some of the pre- and posttest data should be interpreted with caution: for Family History Health Risk factors (a knowledge area rather than a behavior area) it would be unlikely that there would be significant differences on this variable in a random sample of the population of grade 9 students. It is not unlikely, however, that Wellness instruction and discussion in grade 9 would make more students aware of their family's health risk history, particularly since this is part of the Wellness curriculum. Therefore, differences on this variable might have been due to instruction and opportunity to learn. Three of the five high schools for which data were available showed an increase in percent of students who responded "yes" to survey questions related to knowledge of family health risk indicators. Knowledge of family history health risk behaviors can be important in helping students make wise decisions about their own health behaviors.

Although not a FIT-KID objective for improvement, there was a decrease in self-reported physical activity by grade 9 students at all of the high schools for which pre- and posttest data were available (Table 2).

There was a slight but distinct negative correlation on two of the objectives for the FIT-KID NET Wellness project, perhaps an example of the law of unintended consequences. As percent of students who reported eating more vegetables and fruits increased, the percent of students who reported limiting foods high in fats and cholesterol decreased (Figure 1).

Insert Figure 1 about here

It is possible that students increased consumption of vegetables, fruits, and grain products that were either fried or prepared with butter, margarine, bacon, lard, or other ingredients high in fat content. This could be the result of impact of the culture of the community on food preparation, with many fish, poultry, and vegetables dishes commonly prepared by deep frying. The end of the program year and dismissal of students precluded interviews or followup activities with students at Schools C, D, and E to determine if this was the case.

The FIT-KID Teen Health Index (HI)

While pre- and posttest means for each school and for the aggregated population of grade 9 students provided useful data for determining FIT-KID results on the project objectives, because of the large number of items on the NET assessment (41), a Health Index (HI) scale for seven dimensions of Wellness was developed to facilitate identification of relationships between groups of items and theoretical or hypothesized total score on the NET assessment. Scores on identified dimensions would provide valuable information for students, teachers, parents, school administrators, and community agencies. Table 2 provides pre- and posttest means by school for each of the HI dimensions. Figure 2 shows the proposed model for wellness dimensions predicting teen HI score.

Insert Figure 2 about here

The proposed CFA model assumes that the Health Index score is a latent or hypothetical construct that can be predicted by observed scores on dimensions of the wellness Health Index. In the proposed model, an error covariance was set between Nutrition and Self-Care, between Nutrition and Family Health History, and between Substance Abuse and Self-Care. Maximum likelihood estimates for the resultant partially recursive model are shown in Figure 3.

Insert Figure 3 about here

Insert Table 5 about here

Fit indices for factors predicting teen Health Index are provided in Table 5. As shown by the various fit statistics, the value of the $\chi 2$ was small relative to number of degrees of freedom, resulting in an acceptably fitting model, with RMSEA of .037 less than the recommended .05 (Jöreskog & Sörbom, 1999). The model yielded the following measurement equations for each of the seven dimensions:

NUTRITION = 1.15*HI, Errorvar.= 1.60 , R^2 = 0.45
(0.14) (0.22)
8.10 7.14

ACTIVITY = 1.15*HI, Errorvar.= 2.00 , R^2 = 0.40
(0.15) (0.27)
7.64 7.51

HEALTH HISTORY = 0.60*HI, Errorvar.= 2.93 , R^2 = 0.11
(0.16) (0.38)
3.66 7.76

SUBSTANCE ABUSE = 1.86*HI, Errorvar.= 1.45 , R^2 = 0.70
(0.17) (0.25)
11.05 5.69

TRAFFIC SAFETY = 1.27*HI, Errorvar.= 0.84 , R^2 = 0.66
(0.12) (0.12)
10.70 6.83

PERSONAL VALUES = 1.53*HI, Errorvar.= 0.67 , R^2 = 0.78
(0.13) (0.12)
12.16 5.73

SELF-CARE = 1.67*HI, Errorvar.= 1.35 , R^2 = 0.67
(0.16) (0.24)
10.61 5.70

School and Community Involvement

Almost all student activities of the FIT-KID project were designed to take place within the context of the Lifetime Wellness class, or during activities directed by the Wellness teachers. Because Physical Education is taught in conjunction with Wellness classes, they are often the largest classes in their high school, except for band. The USDA NET project emphasizes school and community involvement, with school district project teams to include representative students, parents, school administrators, Wellness teachers, health care providers, and community agencies. Appendix B provides the needs assessment to determine district wide ancillary materials for the FIT-KID project. Results of the needs assessment survey are shown in Tables 6 and 7. The school district's Teacher Center (providing a variety of services for teachers and the community) reported having only one Nutrition-related item out of 38 of its holdings of health-related resources for a school district serving over 16,000 students and their families. Teachers who responded to the ancillary materials needs assessment survey (Appendix B) indicated that their most successful materials were lab kits, manipulatives, computer software, and other hands-on teaching aids, a finding consistent with that of other researchers (Murphy, Youatt, Hoerr, Sawyer & Andrews,1994; Zemel, Brokow, Huntsinger & McMichael, 1993). Of the teachers who responded to the needs assessment survey, 5 indicated that they had ever invited an outside community resource person to speak to their Wellness classes. All Wellness teachers attended the Orientation meeting and at least one planning meeting. Recruitment of Wellness teachers to participate in the FIT-KID project was not difficult, but many were not able to attend some of the meetings due to high school coaching assignment schedules (Harrington et al., 1997).

Insert Tables 6 and 7 about here

Community participants were drawn from the Tennessee State Department of Education, Middle Tennessee State University, the University of Alabama at Birmingham, the University of Tennessee at Knoxville, three Tennessee counties, a County Health Department, a Medical Center, Vanderbilt Hospital, Centennial Hospital, a Family Resource Center, a 4-H/Extension Service, five high schools, and two school districts with a combined total of over 19,000 students. A local health care provider allowed student interns to present lessons in nutrition to grade 9 classes as part of their internship program on a volunteer basis. Interns were provided with advance copies of the FIT-KID project objectives and with the Nutrition strand of the 9th grade Wellness curriculum prior to preparing and presenting their lesson. Each school district Wellness teacher was encouraged to invite a nutrition expert speaker as part of the project. Particular attention was given to providing information specific to the dietary habits and needs of male and female students and of students and their families from different cultural backgrounds. According to the USDA, rural Southern African Americans had a lower score on the Healthy Eating Index than members of any other racial group (Bowman et al., 1998). Tennessee ranked 2nd in the region, but 39th out of 50 states on a composite women's Health and Well-Being Index prepared by the Institute for Women's Policy Research (The Status of Women..., 2000).

In terms of measurable outcomes on the FIT-KID nutrition objectives for grade 9 students, there was no measurable difference in the pre- and posttest percent of students who reported limiting their consumption of cholesterols and high fat foods. There was a significant pre- and posttest gain in percent of students who self-reported consumption of at least 5 servings of fruits, vegetables, and grain products each day. In determining the significance of the study, both effect size and size of the study are considered. Thus, a small effect in a small scale study is not considered to be as important as a small effect in a large scale study. There were over 1,500 grade 9 students served by the FIT-KID project.

Results Mapping Sentences and Facets

A results mapping schema was developed to measure outcomes on the multiple objectives of the FIT-KID project for the 1,500+ grade 9 participants and for school and community partners, with mapping sentences for each of the facets of the project. Development of mapping sentences and identification of facets can be quite complex, particularly in projects with outcomes for multiple levels of participants, but generally speaking according to formal FT based on the work of Guttman and Guilford, facets can be conceived of as sets and subsets of categories, attributes, classes, or parameters (Borg & Shye, 1995). The following is a sample mapping sentence from Borg and Shye (p. 2):

	Positively			
	(p1 = pleasant)			
Person (p) believes that a	(p2 = neutral)	situation with		
	(p3 = unpleasant)			
Number	Variability		Difficulty	
(m1 = many)	(v1 = variable)	events that are	(s1 = difficult)	to handle
( )	( )		( )	
(m2 = few)	(v2 = monotonous)		(s2 = easy)	

Reaction

(very short in duration)

are felt as → to

(very long in duration)

The above facet model contains five facets with 24 possible outcomes on person 1 (3 x 2 x 2 x 2 x 2 = 24). Facets for the grade 9 student participants might include initial status on the specified dimension by gender, at specified age, as a resident of a particular community, for cognitive, affective, or behavior level, provided x number of interventions of a specified type or

combination of types. Thus, if two kinds of interventions are possible and there are 2 interventions provided by the program, the student might be provided one type at time 1 and the second at time 2. A mapping sentence for the NET program objectives might contain the following facets for student participants:

R1 =	(good) ( ) (poor)	Health risk behavior			
The level of	(c1 = cognitive) (c2 = affective) (c3 = behavioral)	functioning at age	(13) (14) (15)	at school	(A) (B) (C) (D) (E)
for	(m1 = male) (m2 = female)	on	Dimension (nutrition) (physical activity) (substance abuse) (traffic safety) (personal values) (self-care)		
with intervention	Kind of Intervention (b1 = ecological) (b2 = psychological)	at time (t) → = R2			

As can be seen, the mapping sentences can become quite complex and can be refined to reflect diverse needs of participant organizations. The models might be written or revised to assign statements of perceived monetary value for certain dimensions, i.e. in terms of long term health benefits to the community and reduced costs associated with better health both in financial and human (quality of life) terms according to number of participants served by the program.

An additional results mapping sentence should be developed to address the school district and community participation component of the project. The facets for school district and community participants might include community agency membership, perceived difficulty in affecting cognitive, affective, or behavioral change on each of the Health Index (HI) dimensions for male or female adolescents, given certain types of resources, and x number of opportunities for intervention, depending upon age of student, school and community climate, and number of participants in the project. The resultant mapping sentence could be expressed in several ways to assess perceptions of degree of relative difficulty on attainment of dimensions:

Person (p), who is a

Membership		Positively		Dimension
(m1 = teacher)	believes it is	(p1 = easy)	to change	(Nutrition)
(m2 = health care)		(p2 = neutral)		(Physical Act)
(m3 = dietician)		(p3 = difficult)		(Substance Abuse)
(m4 = cafeteria personnel)				(Traffic Safety)
(m5 = social service professional)				(Personal Values)
(m6 = school administrator)				(Self-Care)

	Type of Intervention				Gender
at level	(i1 = cognitive)	for adolescents at age	(13)	who are	(g1 = male)
	(i2 = affective)		(14)		(g2 = female)
	(i3 = behavioral)		(15)		
			(16)		

	Location	
students at school	(A)	at time (t)
	(B)	
	(C)	
	(D)	
	(E)	

	Type of Resource
given resource	(r1 = ecological)
	(r2 = psychological)

It is a generally accepted fact that it is more difficult to change attitudes than to learn facts, and it is more difficult to change behaviors than to change attitudes. Thus, meeting goals for changing food consumption habits can be quite challenging, particularly when working with adolescent populations. Educators, health care, and nutrition professionals, when they work together, may develop innovative and effective intervention and reinforcement strategies for the adolescent populations they serve. For example, should students and teachers be offered incentives for demonstrated positive changes in health risk behaviors? What is the effect on intrinsic motivation of various types of incentive and reward programs for positive changes in health risk behaviors?

In conclusion, program efficacy must be assessed in terms of benefits to the community based on such considerations as per pupil expenditure, number of students served, short term and long term results for students and the community, changes in student attitudes and behaviors, and effects of school and community interactions as a result of the program.

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Table 1

Pretest and Posttest Means and Community Demographics for Grade 9 FIT-KID Schools

	41 Item NET Assessment		Community Characteristics			
School	Pretest M (n = 125)	Posttest M (n = 100)	EdLevel%	% Poverty	% Minority	Median Income
A	23.60	22.21	< 1.00	12.5	< 1.00	30,365
B	20.92	22.15	12.00	5.7	24.00	29,243
C	26.57	not available	10.00	12.6	11.00	31,195
D	26.81	21.24	35.00	1.6	< 1.00	55,500
E	25.67	21.42	not available			
FRC	not available		10.00	16.8	22.00	22,583

Note. EdLevel% is percent of residents in the high school's community with bachelor's degree and above. Percent poverty is percent of residents in the high school's community or census tract living below the poverty level. All 5 high schools and the Family Resource Center were located in an urban fringe of a large city, with feeder schools of high schools A and C classified as rural. Community characteristics are provided from 1990 U.S. Census tract data.

Table 2

Pre- and Posttest Rawscore Scale Means by School

School	Nutrition (0 - 6)	Physical Activity (0 - 6)	Family Health History[4] (0 - 5)	Substance Abuse[5] (0 - 7)	Traffic Safety (0 - 4)	Values (0 - 5)	Self Care (0 - 8)
			Pretest				
A	1.88	3.96	2.12	4.16	2.16	3.72	5.60
B	1.76	4.32	1.80	3.67	1.51	3.16	4.64
C	1.88	4.24	2.08	5.30	1.11	4.24	5.96
D	2.80	4.56	1.92	5.36	1.01	4.13	6.05
E	2.04	4.24	2.84	5.25	1.08	3.71	5.92
			Posttest				
A	1.83	3.57	2.38	4.63	2.63	3.87	5.87
B	2.23	3.69	2.35	5.12	2.15	4.23	5.42
C							
D	2.52	3.32	2.36	4.64	2.36	3.76	5.16
E	2.16	3.74	2.16	4.58	2.21	3.95	5.68

Note. The goals and objectives of the NET program specifically addressed only Nutrition, with pre- and posttest sample results in the column headed Nutrition. Posttest data were not available for School C. Survey Nutrition questions are provided in Appendix A. Numbers in parentheses indicate range of possible scores on the scale.

[4]For Family Health History, a higher score indicates that students were aware of relatives who had been diagnosed with a health risk illness such as cancer, heart disease, diabetes, or substance abuse.

[5] For Substance Abuse a higher score indicates lower percent of self-reported substance abuse by students.

Table 3

Pre- and Posttest Means on School District FIT-KID Objectives by School

	School	Pretest (n = 125)	Posttest (n = 100)	ES
I limit high fat foods				
	A	.24	.40	.34
	B	.24	.27	.07
	C	.28		
	D	.48	.28	-.41
	E	.40	.32	-.16
I eat at least 5 servings of fruits, vegetables, grains daily				
	A	.12	.23	.29
	B	.16	.35	.44
	C	.24		
	D	.28	.56	.57
	E	.13	.21	.21

Note. Percent of independent random samples of grade 9 students who answered "yes." Posttest data not available for School C due to illness of Wellness teacher.

Table 4

Analysis of Variance for Fruit, Vegetable, Grain Consumption

Source	SS	df	MSE	F
Between Schools	1.871	3	.624	2.91*
Within Schools	20.569	96	.214	
Total	22.440	99		

Note. $p < .05$

Table 5

Fit Indices for the Health Index Model

	$\chi 2$	df	GFI	AGFI	RMSEA	NFI	CFI	PNFI	PGFI
Partially recursive 7 factor	13.06	11	.97	.93	.037	.97	1.00	.51	.38

Note. GFI, AGFI, RMSEA, NFI, CFI, PNFI, and PGFI refer to goodness-of-fit index, adjusted goodness-of-fit index, root mean square error of approximation, normed fit index, comparative fit index, parsimony normed fit index, and parsimony goodness-of-fit index.

Table 6

Media Center and Wellness Ancillary Materials Needs Assessment

Area of Expressed Need	School						
	A	B	C	D	E	Other	Total
textbooks	3	1				1	5
videos	3	1			1	1	6
computer software	1	1			1	2	5
blackline masters							0
posters	2	1			1	2	6
manipulatives/hands on materials	2	1			1	1	5
lab kits							0
overheads		1			1		2
field trip		1			1		2

Note. "Other" refers to Teachers' Center, Family Resource Center. Wellness teachers indicated that they already had and were using lab kits which they had found to be popular teaching aids.

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Table 7

Pre FIT-KID Use of Community Resources (n = 8)

In teaching grade 9 Nutrition/Wellness, have you ever:	Yes	No	Would like to
Used **any** outside speaker as a classroom resource (physician, parent, etc)		7	---
Used the school cafeteria manager as a classroom resource	2	6	
Used the 4-H/UT Extension service as a resource	1	7	1
Used the County Health Department as a resource	3	5	1
Used a sports nutrition expert as a resource	1	7	3
Used an athletic trainer as a resource	3	5	3

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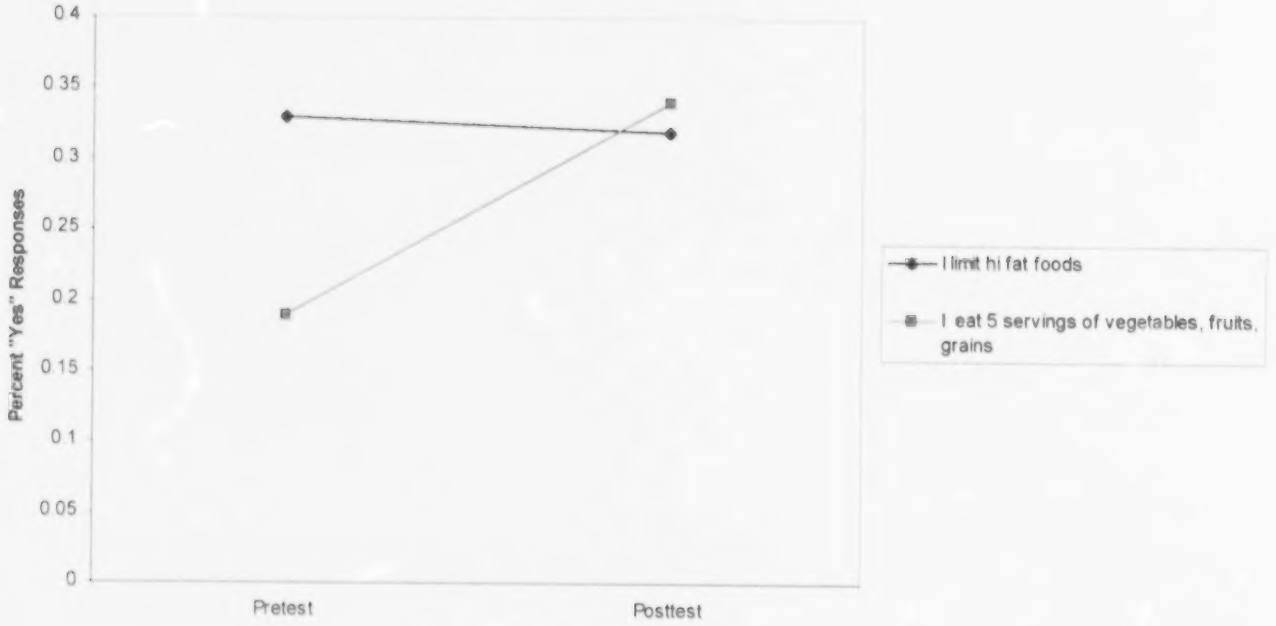

Figure 1. Relation of pre- and posttest responses to "I limit hi fat foods" and "I eat at least 5 servings of vegetables, fruits, and grain products each day."

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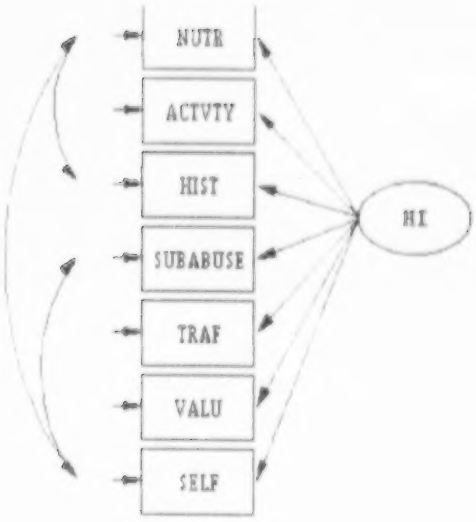

Figure 2. Proposed partially recursive model.

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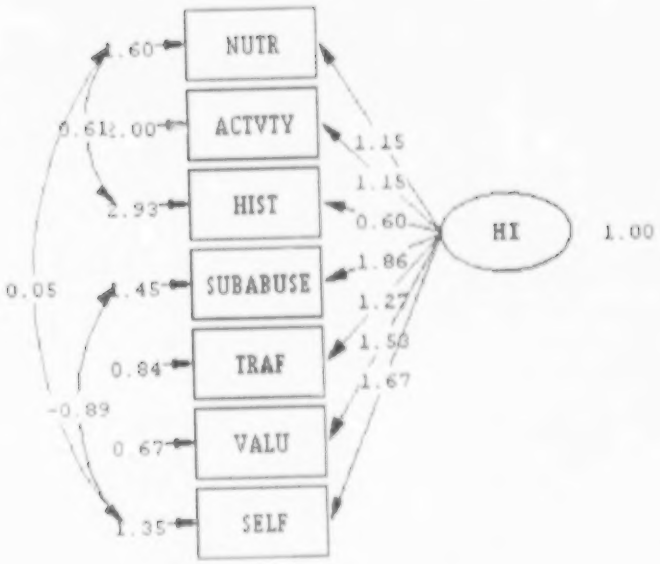

Figure 3. Estimates for the partially recursive model for predictors of teen Health Index.

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APPENDIX A

Questions from the Nutrition Component of the NET Assessment[6]

Survey Question	Scoring
Q1. I limit hi-fat foods to 3 servings/week	0 = No, 1 = Yes
Q2. I limit salt and sodium and do not salt foods	0 = No, 1 = Yes
Q3. I eat fish, poultry more often than red meat	0 = No, 1 = Yes
Q4. I eat 5 servings of fruit, vegetables/day	0 = No, 1 = Yes
Q5. I limit sweets, snacks, sodas to 3 servings per week	0 = No, 1 = Yes
Q6. I drink several glasses of water each day	0 = No, 1 = Yes

[6]Source: Source: TN Nutrition Education & Training Program. (1996). Nashville: Tennessee State Department of Education.

APPENDIX B

Wellness Ancillary Materials Survey for FIT-KID Project

FIT-KID WELLNESS/NUTRITION NEEDS ASSESSMENT

School Name: _____
Faculty/Staff: _____
Teaching Assignment: _____

I. Please place a check beside all resources that you (a) currently have and (b) need that are age/curriculum appropriate for the Nutrition strand of your grade 9 Wellness class

We HAVE:	**We NEED:**
_____ textbooks	_____ textbooks
_____ current videos	_____ current videos
_____ computer software	_____ computer software
_____ blackline masters	_____ blackline masters
_____ posters (Food Pyramid, etc)	_____ posters (Food Pyramid, etc.)
_____ manipulatives/hands on materials	_____ manipulatives, hands-on
_____ lab kits for food preparation	_____ lab kits for food preparation
_____ overhead transparencies	_____ overhead transparencies
_____ other (field trips, etc) please list:	_____ other (field trips, etc) please list:
_____	_____
_____	_____

II. WHICH OF THE ABOVE teaching resources have you found to be the MOST helpful and interesting to your students in teaching Nutrition and Healthy Eating?

(1)_____ (2)_____
(3)_____ (4)_____

Please list the names of any outside speakers who have visited your class to speak about nutrition issues (to avoid inviting the same person twice to the same classroom)

(1)_____
(2)_____

Have you ever used the school cafeteria manager as a classroom resource in teaching Nutrition?
_____(yes) _____(no) _____(I'd like to)
Have you used a speaker or materials from the 4-H/UT Extension service as a resource?
_____(yes) _____(no) _____(I'd like to)
Have you used a speaker or information from the County Health Department as a resource?
_____(yes) _____(no) _____(I'd like to)
Have you used a sports nutrition expert as a resource in teaching Nutrition?
_____(yes) _____(no) _____(I'd like to)
Have you used an athletic trainer as a classroom resource?
_____(yes) _____(no) _____(I'd like to)

USE BACK OF SHEET FOR COMMENTS OR REQUESTS FOR SPECIFIC MATERIALS

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